

WHAT IS CLAIMED IS:

1. A charge pump configured to provide two output voltages by alternately charging and discharging a charge storage component, wherein the charge storage component is coupled in series with a supply voltage and a first load to discharge the charge storage component and to provide power to the first load, and wherein the charge storage component is coupled in series with the supply voltage and a second load to charge the charge storage component and to provide power to the second load.
2. The charge pump of Claim 1, wherein a first voltage provided to the first load is different from a second voltage provided to the second load.
3. The charge pump of Claim 2, wherein the first voltage ranges from 3.0 volts to 5.6 volts, and wherein the second voltage ranges from 1.5 volts to 2.5 volts.
4. The charge pump of Claim 1, wherein a first voltage is provided to the first load and a second voltage is provided to the second load, and wherein at least one of the first voltage and the second voltage is regulated at a voltage different than the supply voltage.
5. The charge pump of Claim 1, wherein a first voltage is provided to the first load and a second voltage is provided to the second load, and wherein the first voltage and the second voltage are regulated independently of the supply voltage.
6. The charge pump of Claim 1, wherein a first current provided to the first load and a second current provided to the second load are substantially equal.
7. The charge pump of Claim 6, wherein the charge pump regulates at least one of the first current and the second current.
8. The charge pump of Claim 7, wherein the first load comprises at least one light emitting diode, and wherein the second load comprises at least one light emitting diode.
9. The charge pump of Claim 7, further comprising a variable current source coupled between the charge storage component and the second load during the charging of the charge storage component to regulate the second current.

10. The charge pump of Claim 7, wherein the first load comprises a plurality of white light emitting diodes for lighting a color display, and wherein the second load comprises a plurality of green light emitting diodes for lighting a key pad.

11. A charge pump regulator configured to drive at least two independent loads, the charge pump regulator comprising:

a charge storage device; and

a plurality of switches that alternately couple the charge storage device in series with a supply voltage to a first load and to a second load, wherein the charge storage device charges when the charge storage device is coupled to the second load and discharges when the charge storage device is coupled to the first load.

12. The charge pump regulator of Claim 11, further comprising a switch timing control that operates the plurality of switches so as to inhibit having the charge storage device coupled in series with the supply voltage and both the first and second loads simultaneously.

13. The charge pump regulator of Claim 11, further comprising a feedback circuit that regulates the charging of the charge storage device based on an output voltage across the first load.

14. The charge pump regulator of Claim 13, wherein the feedback circuit comprises a variable current source coupled in series with the second load and an error amplifier configured to control the variable current source based on a difference between a feedback voltage indicative of the output voltage across the first load and a reference voltage.

15. The charge pump regulator of Claim 14, wherein the reference voltage is selectable among a plurality of reference voltage values.

16. The charge pump regulator of Claim 11, further comprising a feedback circuit that regulates the charging of the charge storage device based on current provided to the first load.

17. The charge pump regulator of Claim 11, wherein the charge storage device is a non-polarized capacitor.